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ABSTRACT

The demographic context that will affect postsecondary education in Western Australia is examined, with attention to recent trends in population growth as well as population distribution and projections to the year 2021. The analysis is based on the 1981 Population and Housing Census and population projections of the Australian Bureau of Statistics (ABS). It is projected that Western Australia's population might grow from 1,299,094 in 1981 to 1,859,031 in 2001; the population of Perth might grow to 1,360,811, about 73.2 percent of the state's population by 2001. Within the Perth Statistical Division, the population residing in the North Metropolitan and Southeast Metropolitan areas is likely to grow at faster rates than the population of other areas. Outside the Perth Statistical Division, population projections are unreliable; however, increases would be expected in coastal towns and their adjacent regions as well as in resource development areas. The influence of the Corridor Plan for Perth on future population distribution is addressed. Appendices include: a summary of ABS assumptions concerning population projections for 1981 to 2021; population projections of Western Australia by age groups (17-24, 25-29, and 30-64) for 1981 to 2001; and a map of the Corridor Plan for Perth. (SW)

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WESTERN AUSTRALIAN POST SECONDARY EDUCATION COMMISSION

POST SECONDARY EDUCATION PLANNING:

THE DEMOGRAPHIC CONTEXT

by

Evan Jones

with assistance from

Jo Jennings

Janette Stuart

This paper has been prepared for the Western Australian Post Secondary Education Commission and is being released in order to promote discussion of some of the important and complex issues facing post-secondary education. The paper should be considered as a discussion document. It is not intended to be a definitive statement of the issue under consideration nor does it necessarily represent the views of the Commission. Any comments on the paper would be welcome and should be forwarded to the Secretary of the Commission, 16 Stirling Highway, Nedlands, WA, 6009.

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I. INTRODUCTION

1. The future development of the post secondary education system in Western Australia will be influenced by a variety of social, political, economic and demographic factors. This paper, which is a revised version of a paper produced for the Commission early in 1982, focuses on the demographic context and reviews trends in population growth and distribution in Western Australia which have occurred in recent year; and it projects trends up to the year 2001. Therefore it does not refer to detailed information on population distribution by sex; nor will it deal with the needs of special groups in the population, be they women, racial or ethnic minorities or the disadvantaged. These questions will be the subject of other WAPSEC investigations.

   It is hoped that the paper will assist those concerned with the future of post secondary education by providing an overview of the major demographic factors which will need to be taken into account in future planning. Current revisions have incorporated the results of the 1981 Population and Housing Census, and Australian Bureau of Statistics population projections 1981 to 2021. It is planned that the paper will be updated annually to provide on-going assistance in the post secondary planning process.

II. FACTORS AFFECTING POPULATION GROWTH

2. Population changes are dependent upon three main variables - fertility rates, mortality rates and migration rates. Migration levels can vary considerably in the short run and it has also proved to be difficult in recent times to accurately predict future trends in fertility rates becuase of a sharp decline in the first birth rates during the 1970's.

3. ABS has recently released four different series of population projections for Australia, States and Territories for the period 1981 to 2021. The ABS emphasises that the projection are not intended as predictions or forecasts; they are simply illustrations of population growth wich would occur if certain selected assumptions regarding future demographic trends were realised. The assumptions are based on an examination of past demographic trends and survey data on birth expectations, but of course there is no certainty that these assumptions and expectations will be realised. The ABS also emphasises that overseas and interstate migration assumptions are set at illustrative levels and do not reflect Bureau estimates of likely future trends. Accordingly, projections including migration (75 000 and 125 000 net per year for Australia as a whole) are provided. The State Treasury also produces population projections for Western Australia and recently released a set of projections for the period 1982-2011.

III. POPULATION GROWTH IN WESTERN AUSTRALIA

4. As might be expected, different assumptions concerning the factors affecting natural population increases produce quite substantial differences between the various sets of population projections. For Western Australia, the projections of population in the year 2001 range from 1 859 031 (Series A) to 2 054 487 (Series D) on the assumption that there will be net migration of either 75 000 or 125 000 per year for Australia as a whole. These differences highlight the sensitivity of the projections to assumptions regarding the values of a few key variables and emphasise the need for caution in using any particular set of projections as a basis for policy decision. A summary of ABS assumptions is provided in Appendix A. Appendix B details the four ABS population projections for Western Australia for the period 1981 to 2001 and the State Treasury projections for the period 1982 to 1993.

5. The State Treasury projections, which were released in December 1982, correspond most closely to the ABS Series B projections. However, the ABS Series A projections, which are somewhat more conservative in view of the assumed lower levels of migration, seem likely to be used by the Commonwealth as the basis for planning for education for the 1985-87 triennium and hence form the basis for the analysis in this paper. The Series A projections assume the following annual level of net immigration for Western Australia.

Overseas	9 800 persons
Interstate	4 000 persons
Total	13 800 persons

6. These projections and other projections contained in this paper relate to the resident population, a concept adopted by the ABS in its 1981 Census publication program. However, in order to illustrate past trends some tables provide both estimated resident population data and Census Counts of population. In brief, the two concepts can be defined as follows:

   Estimated resident population relates to an estimate of the number of persons usually residing in the area referred to in each table.

Census counts of persons relate to the actual location of those persons (whether usual residents or visitors) on census night.

The ABS has published estimated resident population data in respect of Western Australia (all years from Census 1971 to Census 1981) and Perth Statistical Division and local government areas (Census 1976 and Census 1981 only). However, no comparative information is available for urban centres and smaller localities.

7. Table 1 below, which details the Series A population projections for Western Australia, indicates that considerable growth may be anticipated over the priod 1981 to 2001. This is in contrast to the slower rate of growth that is projected for Australia as shown in the same table.

Table 2 shows the differences between the projected average annual rates of growth for Western Australia and Australia.

TABLE 1: PROJECTED POPULATION, WESTERN AUSTRALIA AND AUSTRALIA 1981-2001

Year (at 30 June)	Age Group (years)				Total (all ages)
	Under 15	15-19	20-29	Over 30	
			WESTERN AUSTRALIA		
1981*	337 985	115 442	231 302	614 365	1 299 094
1982	341 243	115 546	235 818	633 852	1 326 459
1984	347 429	117 684	244 167	673 606	1 382 886
1987	352 832	127 783	252 033	736 018	1 468 666
1990	364 805	127 446	260 718	800 141	1 553 110
1995	391 316	121 642	272 333	908 476	1 693 767
2001	411 861	137 545	272 216	1 037 409	1 859 031
			AUSTRALIA		
1981*	3 726 069	1 298 500	2 535 028	7 367 189	14 926 786
1982	3 733 549	1 286 768	2 576 489	7 532 166	15 128 972
1984	3 746 636	1 289 120	2 646 320	7 867 928	15 550 002
1987	3 724 949	1 379 981	2 698 521	8 387 022	16 190 473
1990	3 760 055	1 374 574	2 739 733	8 931 462	16 805 824
1995	3 934 110	1 238 220	2 802 271	9 826 968	17 801 569
2001	4 027 958	1 357 308	2 697 781	10 833 612	18 916 659

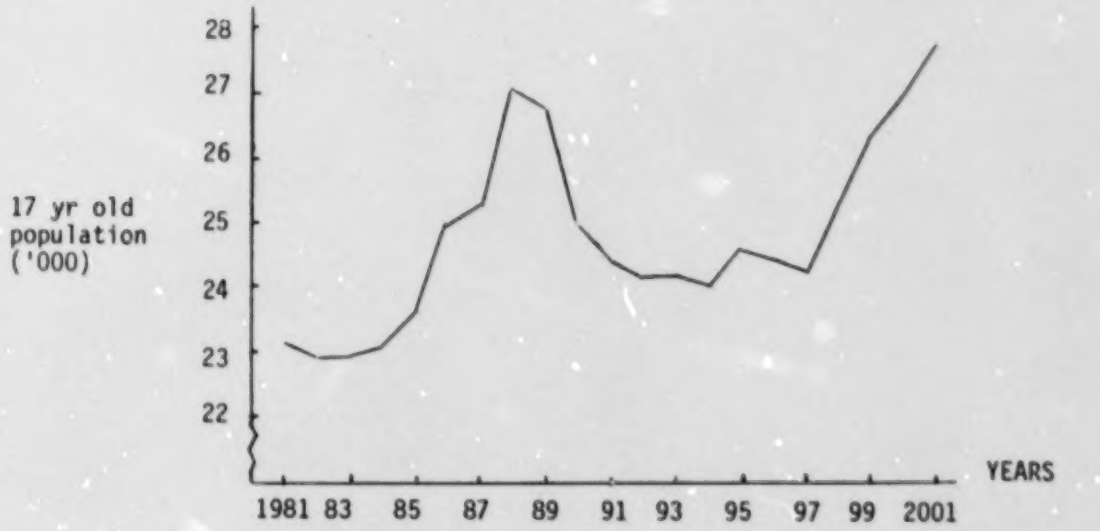
Source: ABS Population Projections
* : Census Estimated Resident Population (ABS 3201.0)

Table 2: PROJECTED AVERAGE ANNUAL RATES OF GROWTH OF POPULATION: WESTERN AUSTRALIA AND AUSTRALIA, 1981-2001

Years	Average annual growth rates (per cent)	
	Western Australia	Australia
1981 to 1984	2.11	1.37
1984 to 1987	2.03	1.35
1987 to 1990	1.89	1.25
1990 to 1995	1.75	1.16
1995 to 2001	1.56	1.02
1981 to 2001	1.81	1.19

8. The ABS population projections by age show interesting trends over the period 1981 to 2001. For example, the 17 year old cohort, the group from which tertiary institutions could draw most of their direct entrants, is projected to decline in size in the early 1980s, rising to a peak in 1988 only to fall again before another increase at the end of the 1990s. This trend is illustrated graphically in Figure 1 below.

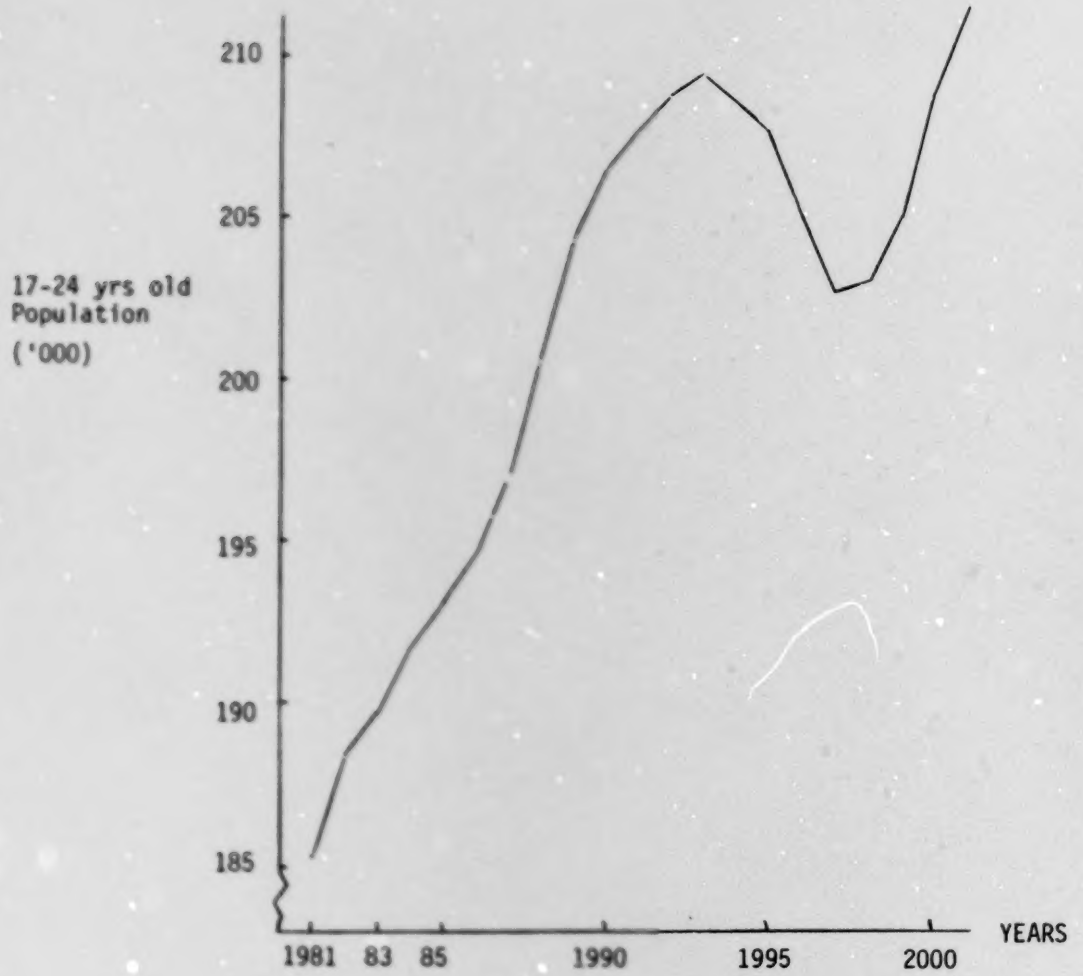
Figure 1: 17 Year Old Age Cohort, WA, Projected Population 1981-2001



Source: ABS microfiche (Series A, Population Projections)

Looking at the 17-24 year old group there is a projected consistent growth in numbers until 1993 after which a decline sets in until the end of the century. Figure 2 graphs this change.

Figure 2: 17-24 Year Old Age Cohort, WA, Projected Population 1981-2001



9. In summary, the projections indicate a somewhat higher rate of population growth for Western Australia than for Australia over the entire period with an increase of about 169 572 persons occurring in Western Australia between 1981 and 1987 and a further increase of 390 365 persons between 1987 and 2001. Some growth in the younger age groups, from which a substantial proportion of post secondary education students have traditionally been drawn, is also anticipated. For example, the 15-29 year old age group population is projected to grow by 33 172 persons or 9.54% (1.53% per annum) between 1981 and 1987 and by a further 29 945 persons or 7.88% (0.54% per annum) between 1987 and 2001. However, a closer look at data for 17 year olds and the 17-24 age group indicates that growth is not constant. There are peaks and troughs over the period which must be taken into account.

IV. POPULATION PROJECTIONS: PERTH STATISTICAL DIVISION

10. In the past, growth has not been spread equally between metropolitan and non-metropolitan areas with Perth's population increasing at a faster rate than the population of the rest of the State. This phenomenon is not unique to Western Australia. However, in comparison with other Australian State capital cities, Perth is the only city to have doubled its post-war population, and its average annual growth rate (of 3.09%) between the population censuses of 1954 and 1981 was also greater than that of the other State capitals.

11. Two reasons have been advanced for this situation. The first is that Perth benefitted directly from the mining boom of the late 1960s and the second is that there are no other towns in Western Australia with an intermediate population size of between 50 000 - 100 000 which have the capacity to attract people away from the major population centre. Tables 3 and 4, below, give an indication of Perth's post war growth.

TABLE 3: POPULATION GROWTH IN THE PERTH STATISTICAL DIVISION, CENSUSES 1954-1981

	Population		Population Growth Between Censuses			
			Number		Average Annual Growth Rate	
Census 30 June	Estimated Resident Population	Census Count	Estimated Resident Population	Census Count	Estimated Resident Population (per cent)	Census Count (per cent)
1954		395 000				
1961		475 398		80 398		2.68
1966		559 298		83 900		3.30
1971		703 199		143 901		4.69
1976	840 220	805 747		102 548		2.76
1981	918 000	898 918	77 780	93 171	1.79	2.21

Source: ABS 3203.5
2405.0

TABLE 4: PROPORTION OF THE POPULATION OF WESTERN AUSTRALIA LOCATED IN THE PERTH STATISTICAL DIVISION: CENSUSES, 1961-1981

Census 30 June	Western Australia		Perth Statistical Division		Proportion of Population in PSD	
	Estimated Resident Population	Census Count	Estimated Resident Population	Census Count	Estimated Resident Population (per cent)	Census Count (per cent)
1961		736 629		475 398		64.5
1966		848 100		558 821		65.9
1971	1 053 834	1 030 469		703 199		68.2
1976	1 178 342	1 142 192	840 220	805 747	71.3	70.5
1981	1 299 094	1 273 624	918 000	898 918	70.7	70.6

Source: ABS 3203.5
3201.0

12. From Table 3 it can be seen that Perth's population growth has been sustained at a relatively high level exceeding 2.2% per annum in all intercensal periods since 1954. The data in Table 4 shows that the Population of Perth Statistical Division grew by 536 995 persons between 1961 and 1981 representing 89% or an annual average increase of 3.24% as compared with Western Australia's population growth of 73% or 2.78% per annum over the same period.

13. In projecting Perth's population forward we need to rely heavily on past events concerning Perth's rate of population growth vis a vis the rest of the State. In 1961, 64.5% of Western Australia's population resided in Perth and by 1981 the proportion had reached 70.6% (based on Census counts).

14. Against this background, the State Treasury in 1982 published population projections for the Perth Statistical Division which suggested that Perth's population might grow to represent 72.7% of Western Australia's population by 1993. These proportions are used in the table below to derive projections of Perth's population from the Series A projections for Western Australia published by the Australian Bureau of Statistics. Since the Treasury has not projected Perth's population past 1993 in detail the proportion of the population residing in the Perth Statistical Division

has been estimated in Table 5 below for the years 1995 and 2001 based on Treasury's projection that 74% of Western Australian population will reside in the Perth Statistical Division by 2011.

TABLE 5: PROJECTED RESIDENT POPULATION OF PERTH STATISTICAL DIVISION 1982 TO 2011

At 30 June	Population of Western Australia (1)	Proportion of WA Population in PSD (2) (per cent)	Population of PSD $\frac{(1) \times (2)}{100}$
Census			
1981	1 229 094	70.7	918 000
Projected			
1982	1 326 459	70.9	940 459
1984	1 382 886	71.4	987 381
1987	1 468 666	72.0	1 057 440
1990	1 553 110	72.4	1 124 451
1995	1 693 767	72.8+	1 233 062
2001	1 859 031	73.2+	1 360 811
2011	2 122 022	74.0	1 570 296

+ interpolation
Sources: ABS Population Projections 1981-2021 (microfiche)
Projected Population of Western Australia and the Perth Statistical Division: State Treasury

15. If the projected 2001 population level for Perth Statistical Division of 1 360 811 persons is to be attained the average annual rate of growth between 1981 and 2001 would need to be 1.99%; this could well be conservative based on rates of growth that have occurred in the past.

16. The population projections produced to this point indicate that post-secondary education institutions may need to service the needs of about 1.86 million people in Western Australia by the turn of the century and 1.36 million of these people would reside in the Perth Statistical Division. The following description examines various possibilities concerning future internal distribution of Perth Statistical Division's population.

V. THE INFLUENCE OF PERTH'S CORRIDOR PLAN ON FUTURE POPULATION DISTRIBUTION

17. The population distribution and development of the Perth metropolitan area is heavily influenced by "The Corridor Plan for Perth" which was adopted by the Metropolitan Region Planning Authority in November 1970. The Corridor Plan was intended to be a framework within which future regional and local growth could be implemented and it still forms the basis of current official planning for the future development of the metropolitan area.

18. The stated purpose of the Corridor Plan is to ensure -

    a) maximum economic efficiency in future development of the Perth metropolitan area;

    b) an enhanced urban environment; and

    c) the preservation of the essential character of the non-urban area.

19. The essential strategy of the Corridor Plan is that future urban development will take place within the urban core and within four corridors radiating out from the core, and that major sub-regional centres will be developed within each of the corridors. The broad land-use allocation proposed in the Plan is shown in Chart 1.

20. Since 1970, Perth's residential development has generally followed the principles of the corridor plan. Independent planners, however, have questioned whether the development of self sufficient regions is now a realistic goal, particularly because of the continued growth of the city and surrounding areas for office and commercial uses. A Perth Region Data Book produced by the Town Planning Department, which analyses 1976 population census data, showed that some 150 000 (or 44%) persons out of a total Perth workforce of 341 409 persons were employed by establishments within the City of Perth. The study highlights the mobility of Perth's workforce, a characteristic that is being reinforced by further office development within close proximity to the city centre. This trend further highlights the problems of developing viable sub-regional centres which provide for a range of community services as well as employment opportunities.

21. While the objectives of the corridor plan provide some indication of the future direction of population growth in the metropolitan area, it is somewhat more difficult to project, with any precision, the size of the population within the various corridors and in the Central core. Unfortunately no official sub-regional population projections exist at this stage although it is known that the Town Planning Department may produce a paper on this topic in the near future.

22. The Perth Region corresponds to an area known as the Perth Statistical Division. Within the Perth Statistical Division there are five Statistical Sub-divisions (see Chart 2 attached) and they form a base upon which population projections might be built. The following table outlines the extent to which population has grown in each Statistical sub-division comprising the Perth Statistical Division over the past 10 years.

TABLE 6: DISTRIBUTION OF POPULATION IN THE PERTH STATISTICAL DIVISION
CENSUSES 30 JUNE 1971, 1976, 1981

Statistical Sub-division	1971		1976		1981	
	Persons	per cent	Persons	per cent	Persons	per cent
			CENSUS COUNTS			
Central Metropolitan	163 429	23.2	148 185	(18.4)	137 295	(15.3)
North Metropolitan	163 502	23.3	217 641	(27.0)	255 469	(28.4)
East Metropolitan	101 683	14.5	119 931	(14.9)	138 453	(15.4)
South-west Metropolitan	135 180	19.2	144 736	(18.0)	159 932	(17.8)
South-east Metropolitan	139 405	19.8	175 254	(21.8)	207 769	(23.1)
TOTAL DIVISION	703 199	100.0	805 747	(100.0)	898 918	(100.0)
			ESTIMATED RESIDENT POPULATION			
Central Metropolitan	not available		148 810	(17.7)	141 710	(15.4)
North Metropolitan			229 780	(27.4)	261 400	(28.5)
East Metropolitan			125 840	(15.0)	140 310	(15.3)
South-west Metropolitan			151 780	(18.1)	164 040	(17.9)
South-east Metropolitan			184 010	(21.9)	210 540	(22.9)
TOTAL DIVISION			840 220	(100.0)	918 000	(100.0)

Source: ABS publications

23. The table clearly shows that the proportion of the population located in the inner city Central Metropolitan area declined over the past decade. Its population also declined in absolute terms by 7 000 to 10 000 persons depending on the series used. Comparisons of the rates of growth achieved between 1971 and 1981 also show that the North Metropolitan and South-east Metropolitan areas grew at a faster rate than the other areas:

TABLE 7: RATE OF GROWTH OF POPULATION; SUB-DIVISION OF PERTH; CENSUSES, 1971-1981

	Census Counts				Estimated Resident Population
	Total Growth 1971-81	Average Annual Rate of Growth			Average Annual Rate of Growth
		1971-76	1976-81	1971-81	1976-81
Central Metropolitan	-16.00	-1.94	-1.52	-1.73	-0.97
North Metropolitan	56.25	5.89	3.26	4.56	2.61
East Metropolitan	36.10	3.36	2.91	3.13	2.20
South-west Metropolitan	18.31	1.38	2.02	1.70	1.57
South-east Metropolitan	49.04	4.68	3.46	4.07	2.73

24. Many factors will of course influence the rate of population growth within each Sub-division including:

- the availability of work within each corridor
- the rate at which new road systems are provided
- the availability of convenient public transport systems
- the extent to which increasing fuel prices will influence choice
- the cost of land and housing and the availability of suitable new land
- the range of community facilities provided (including educational facilities).

25. However, some broad assumptions can be developed from past population trends and these can then serve as a base to project future regional population levels.

a) Recent trends would suggest that population losses will continue to occur in inner city areas due to the limited availability of housing generally, a progressive ageing of the population and the conversion of dwellings to commercial and other non-dwelling use . It is possible that the movement of younger families back to older districts might offset this trend eventually. For the purposes of this study the population of the Central Sub-division is assumed to remain at its estimated 1981 level of 141 710 persons until 2001. This, for the short term, is likely to be an optimistic assumption.

b) Given a no growth situation in the Central Metropolitan area, it follows that future population increases in the Perth Statistical Division will be absorbed within the other four Sub-division. The following table provides a comparison between the respective levels of population growth that have been evident in the remaining Sub-division since 1966.

TABLE 8: POPULATION; PERTH STATISTICAL DIVISION (EXCLUDING CENTRAL STATISTICAL SUB-DIVISION): CENSUSES 30 JUNE 1966-1980

	CENSUS COUNT								Estimated Resident Population	
Statistical Sub-Division	1966 Persons	per-cent	1971 Persons	per-cent	1976 Persons	per-cent	1981 Persons	per-cent	30 June 1981 Persons	percent
Metropolitan:										
North	2 440	0.9	163 562	30.3	217 641	33.1	255 469	33.5	261 400	33.7
East	73 885	26.0	101 682	18.8	119 931	18.2	138 453	18.2	140 310	18.1
South-west	104 145	36.6	135 180	25.1	144 736	22.0	159 932	21.0	164 040	21.1
South-east	103 633	36.5	139 405	25.8	175 254	26.7	207 769	27.3	210 540	27.1
TOTAL	284 103	100	539 769	100	657 562	100	761 623	100	776 290	100

Source: ABS 3203.5

26. The table shows the remarkable growth of the North Metropolitan area between 1966 and 1971 where the population share increased by almost 30%. Since 1971 each Sub-division's share of population growth has shown some stability. On the evidence available it would seem that the North Metropolitan and South-east Metropolitan Sub-division might continue to maintain or slightly increase their

relative positions at the expense of the other Sub-divisions over the next few years. Accordingly, it is assumed that the Sub-divisions will share future population growth in the following proportions:

TABLE 9: PROJECTED DISTRIBUTION OF POPULATION GROWTH WITHIN THE PERTH STATISTICAL DIVISION

Statistical Sub-division	Actual Population Distribution		Projected Distribution		
	1976 percent	1981 percent	1982 percent	1984 percent	Subsequent Years percent
North Metropolitan	33.2	33.7	33.8	34.0	34.0
East Metropolitan	18.2	18.1	18.0	17.5	17.0
South-west Metropolitan	22.0	21.1	21.0	19.5	19.0
South-east Metropolitan	26.6	27.1	27.2	29.0	30.0

27. Table 10 below distributes Perth's projected population increase (as shown in Table 5) according to these proportions:

TABLE 10: PROJECTED POPULATION OF PERTH STATISTICAL DIVISION BY STATISTICAL DIVISION BY STATISTICAL SUB-DIVISION: 30 JUNE 1982 to 2001

Statistical Sub-division	Estimated Resident Population	PROJECTED POPULATION					
	1981	1982	1984	1987	1990	1995	2001
Central Metropolitan	141 710	141 710	141 710	141 710	141 710	141 710	141 710
North Metropolitan	261 400	268 991	284 944	308 764	331 548	368 475	411 910
East Metropolitan	140 310	144 353	152 564	164 474	175 866	194 330	216 047
South-west Metropolitan	164 040	168 756	177 906	191 217	203 949	224 585	248 857
South-east Metropolitan	210 540	216 649	230 256	251 274	271 377	303 960	342 285
TOTAL	918 000	940 459	987 381	1057 440	1124 451	1233 062	1360 811

28. The resultant projected rates of growth are quite modest in terms of growth rates experienced by Perth as a whole since the 1950s. Excluding the Central area, in which a no-growth situation is assumed, the growth rates (1981 to 2001) for the metropolitan regions vary from a low of 2.11 per annum for the South-West Metropolitan Sub-division to a high rate of 2.46% per annum for the South-east Metropolitan Sub-division. The most significant result shown by the projections is that the population within the North Metropolitan and South-East Metropolitan areas would grow to account for

well over one-half (55.42%) of Perth's population in 2001. Conversely, the Central Metropolitan's share would decline from 15.4% in 1981 to 10.4% in 2001.

VI. POPULATION DISTRIBUTION: COUNTRY AREAS - PRESENT AND FUTURE

29. The population of the Perth Metropolitan area is projected to grow at a faster rate than that of non-metropolitan areas. Some limited and isolated growth should occur in some areas outside Perth over the next twenty years, if past trends are any indication. The 1981 Census results showed that some 381 094 persons resided outside the Perth Statistical Division. Table 6 indicates that a projected growth of the population of Western Australia of some 559 937 persons between 1981 and the year 2001 may produce a projected population increase of 442 811 persons in the Perth Statistical Division. During this 20 year period, therefore, the population residing outside Perth may grow by some 117 128 persons or from 381 094 to 498 222 persons.

30. While trends on the movement of population in local government areas, urban centres and towns, can be derived from past data, it is exceptionally difficult to project population growth in non-metropolitan areas as much depends on a number of unpredictable factors, such as:

- mineral discoveries and decisions to proceed with resources development
- consolidation of farms and the opening of new farming areas
- climatic changes and resultant drought or prosperity for farming communities
- government policy and decisions

31. The population of the various statistical Divisions at the 1971, 1976 and 1981 Censuses:

TABLE 11: POPULATION OF WESTERN AUSTRALIA BY STATISTICAL DIVISION (OTHER THAN PERTH STATISTICAL DIVISION); CENSUSES 30 JUNE, 1971 AND 1976, AND 1981

Statistical Division	Census Count			Estimated Resident Population	
	1971	1976	1981	1976	1981
South West	76 633	81 866	97 834	86 500	102 250
Lower Great Southern	38 297	38 772	42 287	40 480	44 520
Upper Great Southern	23 902	23 449	22 757	24 180	23 920
Midlands	52 753	50 384	48 303	51 510	50 540
South Eastern	40 430	39 946	42 818	40 640	43 480
Central	44 713	48 411	52 059	46 500	50 920
Pilbara	32 979	38 687	47 284	34 500	47 590
Kimberley	14 602	15 130	19 296	13 810	17 970
TOTAL	324 309	336 445	372 638	338 120	381 090

Source: ABS "Demography" 1976 and ABS Catalogue No 3203.5

32. The following table provides an indication of the rate of change of population levels in selected urban centres between the Censuses of 1966 and 1981. It shows that very modest population changes occurred in respect of inland agricultural towns. On the other hand most coastal towns were centres of population growth.

TABLE 12: POPULATION IN URBAN CENTRES OF WESTERN AUSTRALIA: CENSUSES, 30 JUNE 1966, 1971 AND 1976 AND 1981

Statistical Division and Urban Centre	1966	1971	1976	1981	Average annual rate of change 1966-81 percent	1976-81 percent
South West						
Bunbury	15 467	17 815	19 513	21 749	2.30	2.19
Mandurah	2 730	5 062	7 050	10 978	9.72	9.26
Collie	7 669	6 734	6 771	7 667	0.00	2.52
Busselton	4 278	4 983	5 550	6 463	2.79	3.09
Manjimup	3 186	3 526	3 734	4 150	1.78	2.14
Lower Great Southern						
Albany	11 440	13 101	13 696	15 222	1.92	2.14
Katanning	3 596	3 670	4 162	4 413	1.37	1.18
Upper Great Southern						
Narrogin	4 878	4 849	4 312	4 969	0.12	0.64

Midlands						
Northam	7 413	7 167	6 866	6 791	-0.58	-0.22
Merredin	3 601	3 553	3 661	3 520	-0.15	-0.78
South Eastern						
Kalgoorlie-Boulder	19 980	20 865	19 041	19 848	-0.04	0.83
Kambalda	na	4 224	4 784	4 463	na	-1.38
Esperance	2 698	4 874	5 262	6 375	5.90	3.91
Central						
Geraldton	12 196	15 457	18 773	20 895	3.65	2.16
Carnarvon	3 086	4 242	5 341	5 053	3.34	-1.10
Pilbara						
Port Hedland	! 920	7 229	11 144	12 948	13.57	3.05
Newman	na	3 906	4 672	5 466	na	3.19
Karratha	na	1 838	4 243	8 341	na	14.47
Tom Price	549	3 426	3 193	3 540	13.23	2.08
Dampier	1 080	3 585	2 727	2 471	5.67	-1.95
Kimberley						
Derby	1 843	2 538	2 411	2 933	3.15	4.00

na = not applicable
Sources: ABS 1971 Census publications Ref No 2.88.9
Western Australian Year Book 1980
ABS 2405.0

33. Having established some trends the task of projecting population change is most difficult since there is no authoritative source available which enables this to be done with any degree of confidence. However, over recent years the Department of Resources Development has undertaken demographic studies of particular areas of the State including the:

Shire of Esperance
Albany Region
Eastern Goldfields Region
Pilbara Region
South West Region

34. These studies reveal that:

. The population of the Shire of Esperance could grow by between 3 800 to 6 000 persons in the period from 1976 to 1991.

- There is little prospect of growth in the Albany Region during the immediate future although diversification of the Albany Town's economy would widen its prospects for growth in the longer term.

- The Eastern Goldfields population might grow by as few as 8 000 persons or by as many as 26 000 persons in the period 1980 to 1990. The projections are based on an assumed long term stability in high metal prices and vary considerably due to uncertainty as to the extent to which mineral deposits might be commercially exploited.

- The permanent population of the Pilbara Region may increase by about 19 000 persons between 1979 and 1990 based on some improvement in iron ore production tonnages and a workforce of some 500 persons who will be associated with the operations phase of the NW Shelf project from 1984 onwards. The NW Shelf permanent workforce will be located at Karratha.

- Growth of population in the South West Region during the period 1981-1990 is expected to continue at the high levels as has been the experience between 1971 and 1981 (2.4% per annum or 3.4% from 1976-1980 on an estimated resident basis). A recent report by the Department of Resources Development entitled "Employment and Population in the South West 1981-1990" analyses growth prospects in each of the four statistical sub-divisions of the region. The report concludes that:

  "The distribution of the expected economic growth between the four sub-divisions will reflect their relative natural resources endowments or the significance of their urban centres.

  The Murray and Preston sub-divisions are expected to continue to dominate growth within the South-West. In Vasse and Blackwood the employment and population situation should remain stable, with the former expected to show sounder growth than the latter."

More specifically the Department projects the following possible growth rates:

	Min	Max
Murray	1.0	2.3
Preston	2.7	3.1
Vasse	0.1	0.7
Blackwood	-1.6	0.1

The stronger growth rates in Murray and Preston are foreseen as a consequence of the Wagerup and Worsley bauxite/alumina projects and expansion of tourism with Mandurah as a retirement and holiday centre. In real terms there is projected an increase of 12 900 to 20 150 persons.

35. The picture is therefore one in which resources development should play a major part in determining the way in which population may be distributed throughout the State over the next twenty years. Large population increases are projected for the Pilbara and Eastern Goldfields Regions as a consequence and some population losses might be expected in central agricultural areas. The South West Region and coastal towns and areas around Carnarvon, Geraldton, Bunbury, Busselton and Albany (to a lesser extent) and Esperance could continue to attract population.

VII. POPULATION GROWTH: SUMMARY

36. This paper has projected Western Australia's population forward on the basis of a number of assumptions, some of which might well prove to be ill founded. In summary, the conclusions reached by applying these assumptions are that:

- Western Australia's population might grow from 1 299 094 persons in 1981 to 1 859 931 persons in 2001 and the resultant rate of growth over the period would then be 1.81% compared with a projected national rate 1.19%.

- Perth's population might grow to 1 360 811 persons or to some 75.2% of the State's population by 2001. This would provide for rate of increase of 1.99 which could prove to be conservative based on past history.

- Within the Perth Statistical Division the population residing in the North Metropolitan and South-east Metropolitan areas is likely to grow at faster rates that the population of other areas. Population numbers within those areas are likely to represent about 55.4% of Perth's population by 2001.

- Outside the Perth Statistical Division population projections are unreliable; however, increases would be expected in coastal towns and their adjacent regions as well as in resource development areas. It is expected that total non-metropolitan population levels might grow by 117 000 in the period 1981 to 2001.

9 August 1983
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APPENDIX A

SUMMARY OF ASSUMPTIONS

AUSTRALIAN BUREAU OF STATISTICS

POPULATION PROJECTIONS

1981 TO 2021

Series A:

Fertility—Total fertility rates for Australia are assumed to increase from 1,936 per 1,000 women in 1981 to 2,010 by 1984 and then to decline to a low of 1,900 by 1987, at which level they remain to the end of the projection period. The age-specific rates for each State and Territory except South Australia are assumed to converge upon the projected Australian rates by 1987 and remain at the Australian level thereafter. South Australia's projected age-specific rates are 10 per cent below the projected Australian rates.

Mortality—For Australia, mortality rates are projected to decline for the period of the projections. The projected life expectancies at birth are 72.25 and 73.42 years for males, and 79.58 and 82.64 years for females in 1986 and 2021 respectively. In 1981, the expectations of life at birth were 71.38 years for males and 78.42 years for females. For each State and Territory except the Northern Territory, the projected mortality rates are the same as for Australia. For the Northern Territory mortality rates are assumed to converge upon Australia's projected rates by 1990.

Net migration gain—The assumed net migration gain by each State and Territory from interstate and permanent overseas movement is as follows—

NET MIGRATION GAIN ('000 PERSONS)

	N.S.W.	*Vic.*	*Qld*	*S.A.*	*W.A.*	*Tas.*	*N.T.*	*A.C.T.*	*Aust.*
Overseas	28.7	19.3	11.3	4.0	9.8	0.7	0.7	0.5	75.0
Interstate	-10.0	-15.0	25.0	-5.0	4.0	-1.0	2.0	..	..
Total	**18.7**	**4.3**	**36.3**	**-1.0**	**13.8**	**-0.3**	**2.7**	**0.5**	**75.0**

Series B:

Fertility—Total fertility rates for Australia are assumed to steadily increase from 1,936 per 1,000 women in 1981 to a long-term replacement level of 2,110 in 1987, remaining constant thereafter. The age-specific rates for each State and Territory except South Australia are assumed to converge upon the projected Australian rates by 1987 and remain at the Australian level thereafter. South Australia's projected age-specific rates are 10 per cent below the projected Australian rates.

Mortality and net migration gain—as in Series A

Series C:

Fertility and mortality—as in Series A

Net migration gain—The assumed net migration gain by each State and Territory from interstate and permanent overseas movement is as follows—

NET MIGRATION GAIN ('000 PERSONS)

	N.S.W.	*Vic.*	*Qld*	*S.A.*	*W.A.*	*Tas.*	*N.T.*	*A.C.T.*	*Aust.*
Overseas	47.7	31.7	18.7	7.1	16.3	1.3	1.2	1.0	125.0
Interstate	-10.0	-15.0	25.0	-5.0	4.0	-1.0	2.0	..	..
Total	**37.7**	**16.7**	**43.7**	**2.1**	**20.3**	**0.3**	**3.2**	**1.0**	**125.0**

Series D:

Fertility—as in Series B

Mortality—as in Series A

Net migration gain—as in Series C

SOURCE: ABS Cat. 32140

APPENDIX B

PROJECTED POPULATION OF WESTERN AUSTRALIA
1981-2001
(ABS AND TREASURY PROJECTIONS)

	ABS: Western Australia				Treasury Department	
	Series A	Series B	Series C	Series D	WA	Perth
1981	1299094	1299094	1299094	1299094		
1982	1326459	1326470	1333015	1333025	1333148	945182
1983	1354334	1354413	1367573	1367652	1362116	969791
1984	1382886	1383137	1402936	1403192	1391986	993845
1985	1411703	1412622	1438702	1439643	1422679	1018607
1986	1440380	1442793	1474396	1476875	1454082	1044002
1987	1468666	1473312	1509801	1514594	1485915	1069838
1988	1496764	1504027	1545102	1552617	1518004	1094456
1989	1524916	1534840	1580553	1590850	1550320	1120847
1990	1553110	1565735	1616115	1629246	1582882	1145980
1991	1581313	1596679	1651751	1667768	1615656	1171323
1992	1609541	1627682	1687470	1706421	1648674	1196912
1993	1637706	1658656	1723213	1745141	1681883	1222695
1995	1693767	1720422	1794615	1822612		
2001	1859031	1903342	2007476	2054487		

APPENDIX C: POPULATION PROJECTIONS OF WESTERN AUSTRALIA; SELECTED AGES AND AGE GROUPS: 1981-2001

Table 1: Persons 15, 16, 17 Years of Age

30 June	15 years	16 years	17 years
1981	22722	22827	23113
1982	22891	22835	22926
1983	23422	23006	22936
1984	24775	23536	23104
1985	25048	24886	23635
1986	26879	25160	24985
1987	26514	26988	25258
1988	24788	26625	27084
1989	24206	24899	26722
1990	23939	24317	24996
1991	23971	24053	24414
1992	23862	24084	24152
1993	24383	23973	24181
1994	24252	24493	24071
1995	24036	24362	24591
1996	25102	24147	24458
1997	26144	25211	24244
1998	26774	26255	25308
1999	27588	26884	26350
2000	27980	27696	26978
2001	27948	28088	27790

Source: ABS Projections of Population, Series A

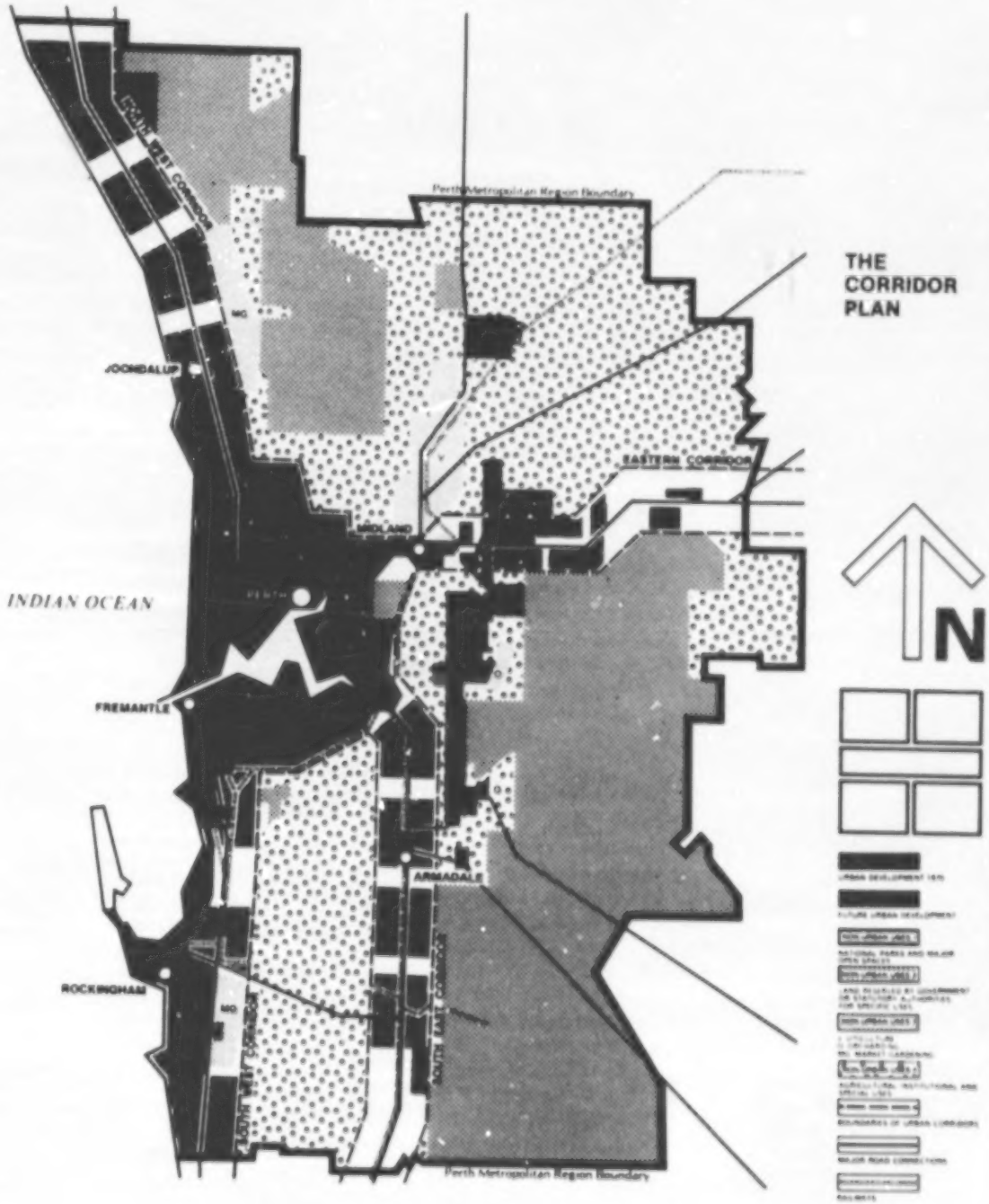
APPENDIX C: continued

Table 2: Persons in Age Groups, 17-24, 25-29, 30-64 Years

30 June	17-24 years	25-29 years	30-64 years
1981	186272	114923	501385
1982	188520	117118	517710
1983	189764	119506	534956
1984	191686	121854	552288
1985	193025	124428	568653
1986	194781	126965	585004
1987	197032	129282	601245
1988	200739	131325	618000
1989	204333	132895	634966
1990	206383	133525	652392
1991	207843	133234	670513
1992	208875	133338	688042
1993	209403	133602	705619
1994	208488	135451	722938
1995	207822	137755	740018
1996	205216	141861	756292
1997	202757	145448	773432
1998	203087	146783	790912
1999	205032	146215	809945
2000	208761	145119	828495
2001	211461	142264	848069

Source: ABS Projections of Population, Series A.

CHART 1



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PERTH METROPOLITAN REGION: CORRIDOR PLAN CONCEPT

ENLARGEMENT

LOCAL GOVERNMENT AREAS

01 PERTH

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CHART 2